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## (54) Roof for a passenger car

(57) The invention relates to a roof for a passenger car, with headlamp and light units located in roof spars. In order to locate the headlamp and light arrangements at a favourable mounting height and in a streamlined arrangement, the roof (4) is designed as a preferably monocoque component which is reinforced via a bulged-out portion (5) which extends from the front, rearwards in a wedge-shaped manner from the centre of the

roof width and laterally outwards approximately from the centre of the roof length and which is made trapezoidal in cross-section and T-shaped in a plan view, and on the approximately vertical faces (6, 7 and 8), directed forwards, rearwards and laterally, of the crossbeam of the T-shaped bulged-out portion (5) headlamps (9), rear lights (10) and indicator lights (11) are located. The headlamp and light units can be inserted in appropriate recesses of the roof, which can be made of plastics material or can be formed partially by the latter. However, the headlamp and light arrangements can also be attached as constructional units having a V-shaped or curved form in a plan view.

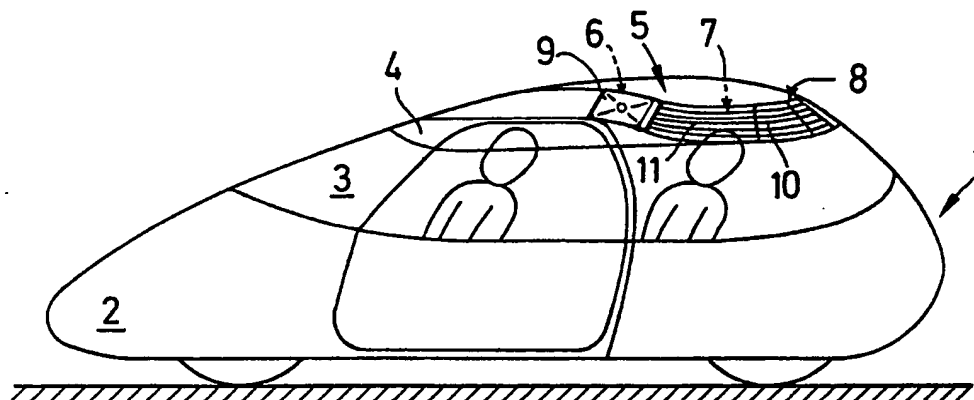


FIG.1

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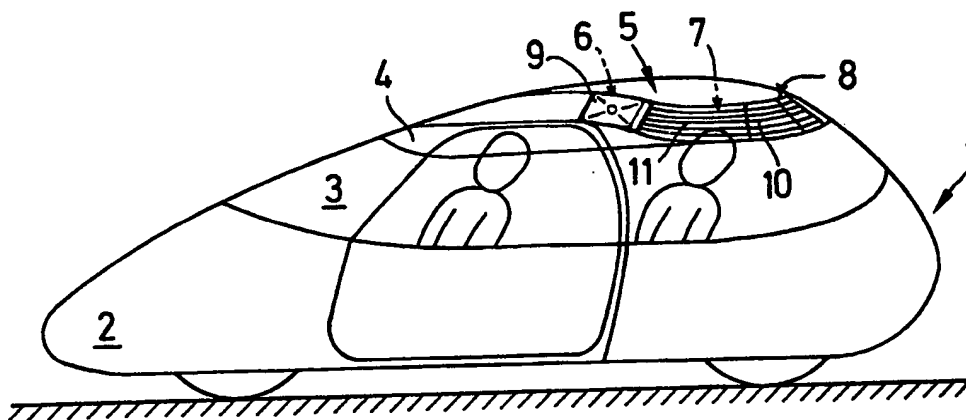


FIG. 1

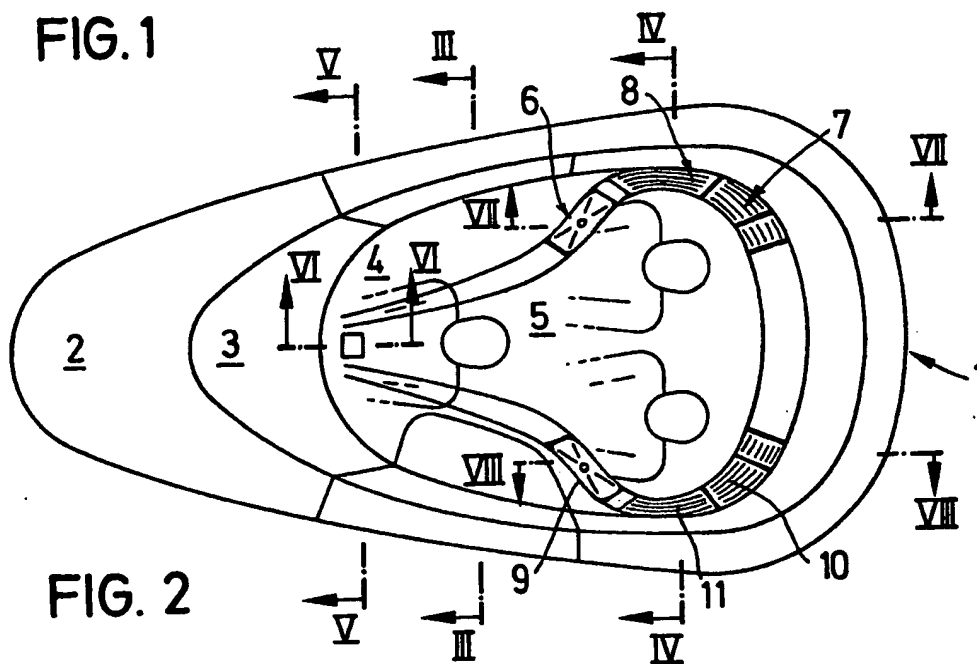


FIG. 2

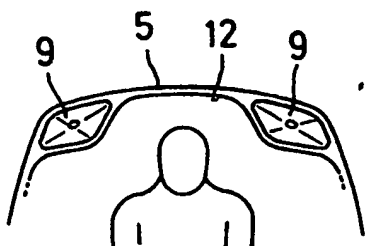


FIG. 3

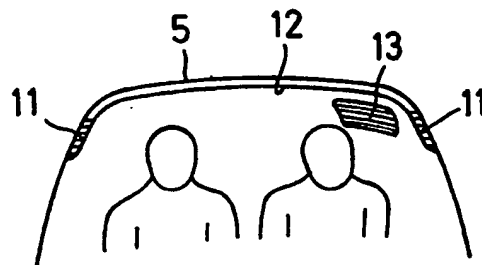


FIG. 4

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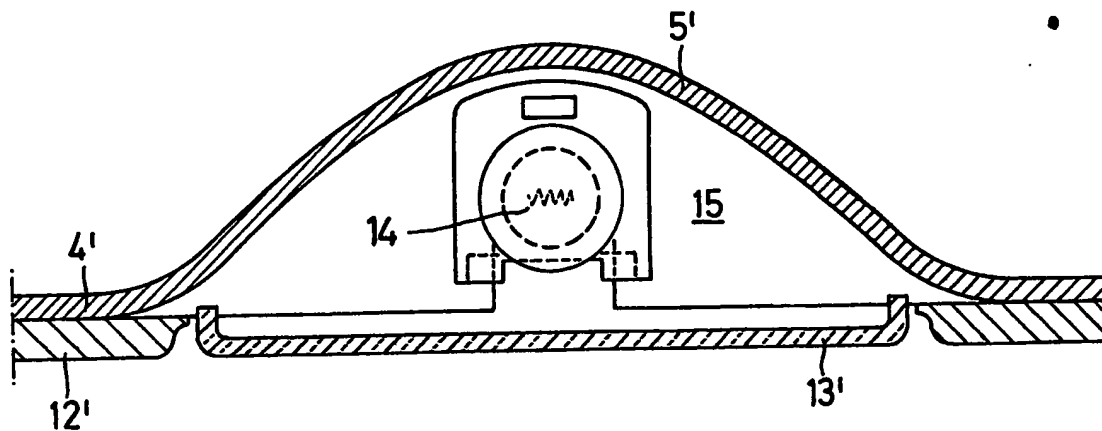


FIG. 5

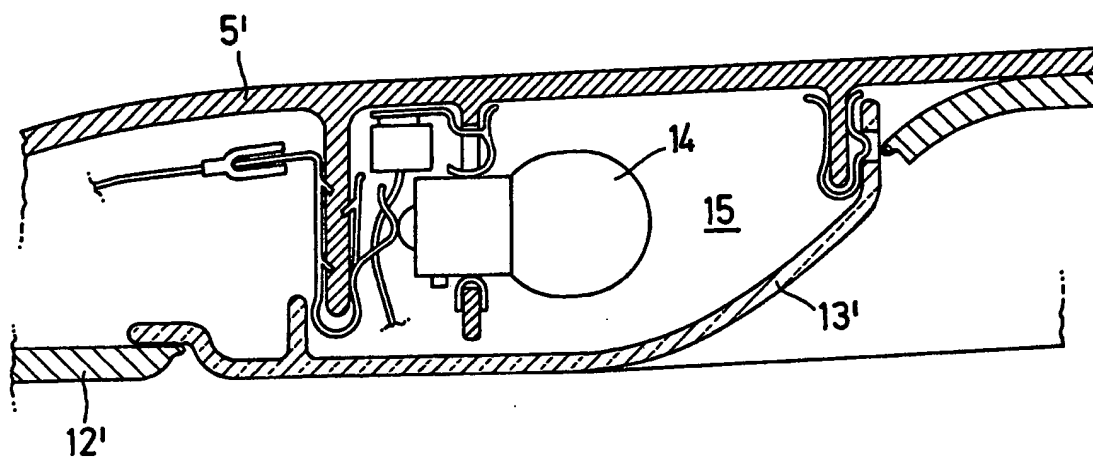


FIG. 6

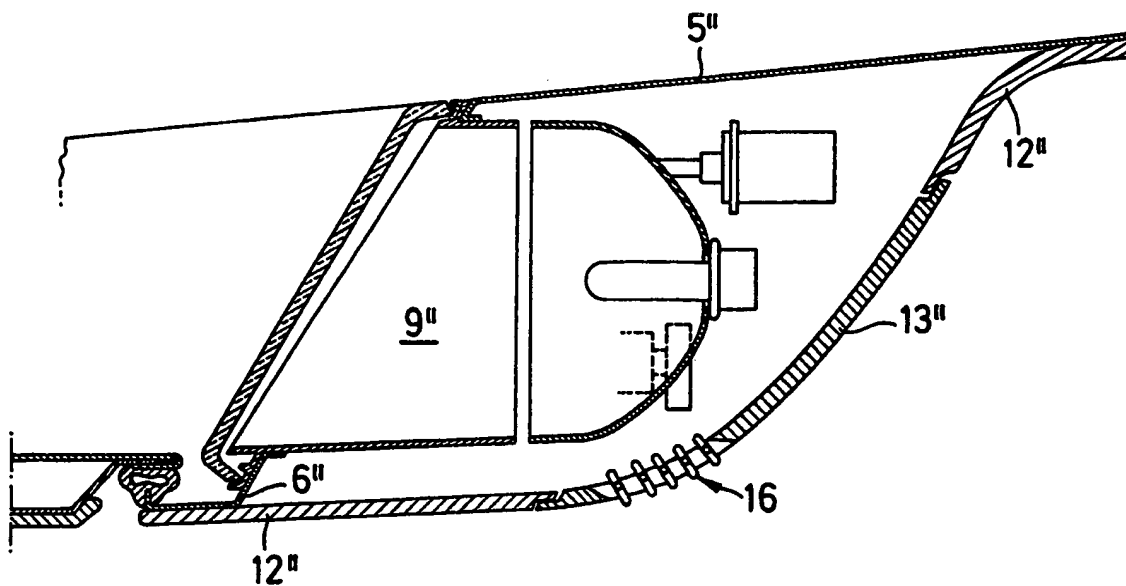


FIG. 7A

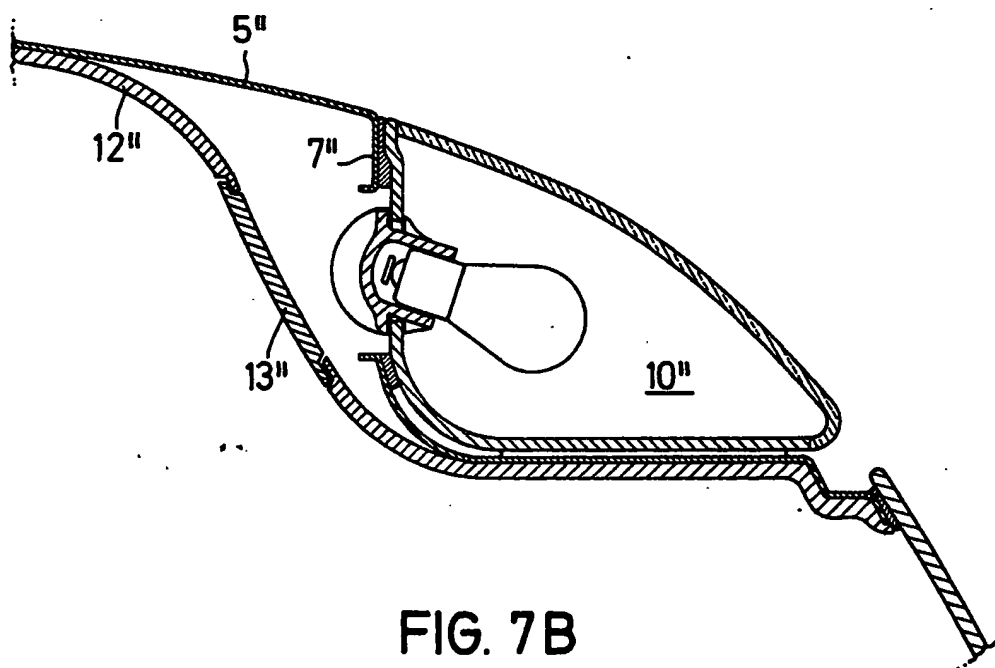


FIG. 7B

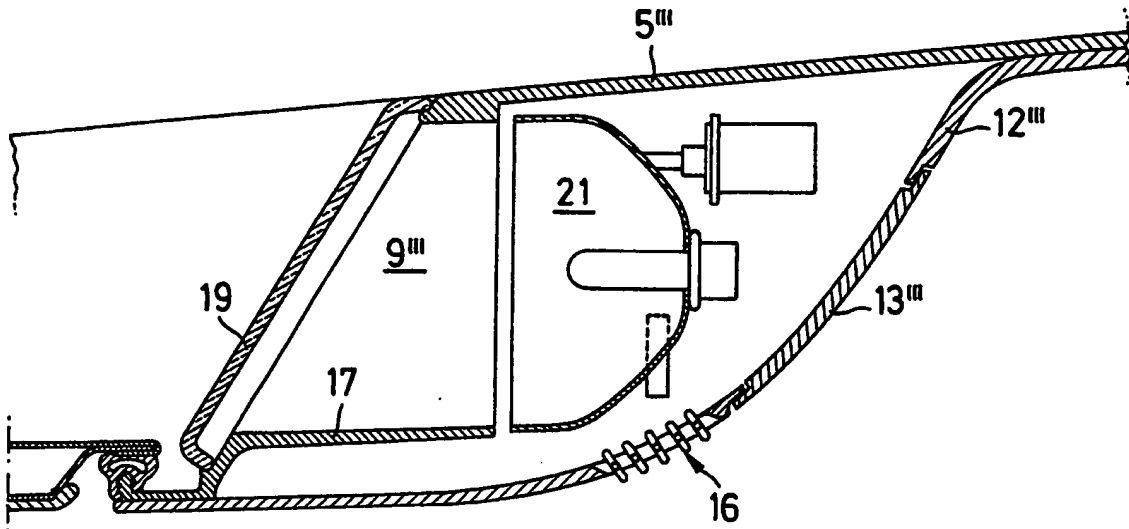


FIG. 8 A

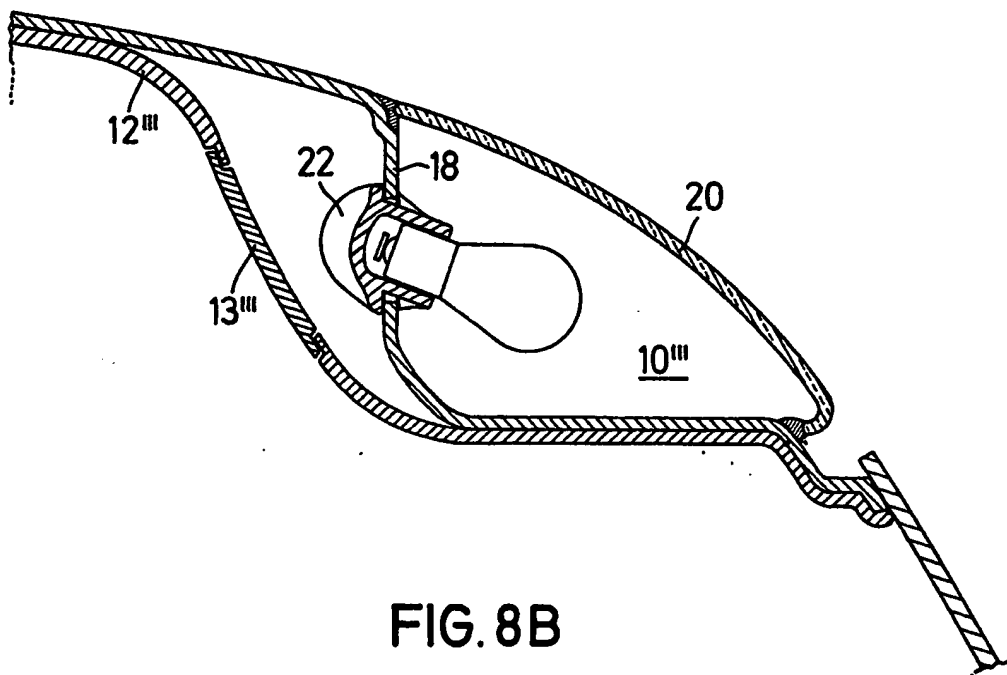


FIG. 8B

## SPECIFICATION

## Roof for a passenger car

The invention relates to a roof for a passenger car.

- 5     Roofs for passenger cars are already known from German Offenlegungsschriften 1,780,299 and 2,158,962, and in these headlamp and light units are accommodated in marginal regions, partially in roof spars.
- 10    These known roofs for passenger cars have the disadvantage that, to maintain headroom for the vehicle occupants, the roof spars housing the headlamp and light units either have to be located above the roof proper or have to be provided
- 15    underneath the roof in its marginal region, resulting in the first case, in an impairment of the aerodynamics of the motor vehicle and, in the other case, in restricting entry into the vehicle and visibility from the vehicle.
- 20    The tendency, which is strong at the present time in motor vehicle construction, towards smaller, increasingly more streamlined passenger cars, has lead to difficulties in arranging headlamps at the front end of passenger cars,
- 25    which are becoming increasingly more wedge-shaped and lower.
- To enable the minimum mounting heights above ground, as prescribed by law to meet lighting requirements, to be maintained, the most
- 30    diverse and expensive retractable headlamp designs have been developed, but all of these have basic disadvantages. In particular, they are expensive to construct and they considerably disturb the aerodynamics of the vehicle when the
- 35    headlamps are switch on, that is to say raised.
- A further proposal for solving these difficulties in small streamlined passenger cars has become known from German Offenlegungsschrift
- 40    2,522,058. Here, the headlamps are located at the height of the dashboard behind the windscreen, to enable the desired mounting height to be achieved with permanently built-in headlamps. Although a lower outlay in terms of construction is possible here in comparison with
- 45    retractable headlamps, nevertheless increased production costs arise because of the arrangement of the headlamps in the region of the dashboard and because of the design of the windscreen necessary to meet the requirements of the
- 50    headlamps.
- The invention seeks to mitigate the above difficulties and to provide a streamlined arrangement which may be constructed inexpensively.
- 55    According to the present invention, there is provided a roof for a passenger car as herein set forth in Claim 1.
- Preferred features of the invention are set forth in Claims 2 to 4.
- 60    According to a second aspect of the invention, there is provided a motor car as set forth in Claim 8.
- When the roof is designed as a monocoque component which is reinforced via a bulged-

- 65    out portion which extends from the front, rearwards in a wedge-shaped manner from the centre of the roof width and laterally outwards approximately from the centre of the roof length and which is made approximately trapezoidal in cross-section and approximately T-shaped in a
- 70    plan view, and in the approximately vertical faces, directed forwards, rearwards and alterally, of the crossbeam of the T-shaped bulged-out portion, headlamps, rear lights and indicator lights are
- 75    located, it becomes possible to arrange the headlamps and lights in the regions of the roof which are located outside the headroom zone of the vehicle passengers, and also this arrangement does not impair their conditions governing entry to
- 80    the vehicle and visibility from the vehicle.

- If the headlamp and light arrangements are attached on the faces from outside and, when appropriate, are joined together into a single constructional unit which is V-shaped or curved in
- 85    a plan view, the outlay in terms of assembly can be further reduced substantially.

- The invention will now be described further, by way of example with reference to the accompanying drawings in which:—

- 90    Figure 1 shows a side view of a small, streamlined passenger car with a roof according to the invention.

- Figure 2 shows a plan view of the passenger car according to Fig. 1.

- 95    Figure 3 shows a partial section along the line III—III in Figure 2, and

- Figure 4 shows a partial section along the line IV—IV.

- Figure 5 shows a section along the line V—V in Figure 2.

- 100   Figure 6 shows a section along the line VI—VI in Figure 2.

- Figures 7A and 7B show a vertical section along the line VII—VII in Figure 2 through an embodiment of the invention in which the roof is made as a sheet-metal pressing, and

- 105   Figure 8A and 8B show a vertical section along the line VIII—VIII in Figure 2 through an embodiment of the invention in which the roof is made as a plastics constructional part.

- 110   Figures 1 and 2 show a small, streamlined passenger car 1 with a flat, wedge-shaped front end 2 and a streamlined passenger-compartment window-system 3. The passenger-compartment window-system 3 is covered by a roof 4 which is preferably designed as a monocoque component made of sheet-metal or a plastics material.

- 115   The roof 4 has a reinforcing bulged-out portion 5 which extends from the front, rearwards in a wedge-shaped manner from the centre of the roof width and laterally outwards approximately from the centre of the roof length and which is made trapezoidal in cross-section and T-shaped in a plan view. Headlamps 9, rear lights 10 and indicator
- 120   lights 11 are located on the approximately vertical faces 6, 7 and 8, directed forwards, rearwards and laterally, of the crossbeam of the T-shaped bulged-out portion 5.

- It is evident from Figures 3 and 4 that the roof

according to the invention can be used preferably in conjunction with a seat arrangement for three persons and a so-called T-beam roof in which it is also possible, relatively simply, to lift the doors

5 into the roof to improve the conditions governing entry to the vehicle.

The headlamp and light units 9, 10 and 11 can be inserted in recesses in the faces 6, 7 and 8 of the bulged-out portion 5, can be covered in the

10 vehicle interior by a roof interior lining 12 and can be accessible for adjustment and maintenance via orifices and flaps 13 provided in this lining. However, the roof 4 can alternatively be made, in an especially advantageous way, as a plastics part

15 in which housings the headlamp and light units 9, 10 and 11 are also formed. As is evident from Figures 5 and 6 which show sections through an embodiment of the invention in which the roof is made as a plastics

20 constructional part, an interior light 14 can be located in a favourable way in the front wedge-shaped part of the bulged-out portion 5' of the roof 4', the light chamber 15 being formed directly by parts of the bulged-out portion 5' and covered

25 by a flap 13' designed at the same time as a translucent pane. Figures 7A and 7B which show a vertical section through an embodiment of the roof as a sheet-metal pressing illustrate especially clearly

30 the arrangement of the headlamps 9'' and rear lights 10'' which are located respectively in the faces 6'' and 7'' of the T-shaped bulged-out portion 5'' which are directed forwards and rearwards respectively. The roof is, again, lined on the inside with a roof

35 interior lining 12'' which forms, together with the roof shape, appropriate housing spaces for the lighting devices. In this connection, orifices necessary for adjusting and maintaining the

40 lighting devices can be covered in a simple way by flaps 13'' which are designed as translucent panes and which can, at the same time, assume the function of the vehicle interior light when the

45 lighting devices are in operation. As indicated in Figure 7A at 16, parts of the roof interior lining 12'' can be designed as fixed or adjustable blinds, to permit, in this way, an

50 appropriate darkening of the interior lighting. In a similar way, appropriate darkening slides can be provided when the flaps 13'' are designed as translucent panes.

The arrangement of the lighting devices can be taken again from Figures 8A and 8B which show a

55 vertical section through an embodiment of the roof as a plastics constructional part. In the roof made of plastics material the bulged-out portion 5' can be shaped in such a way that it forms parts of the light arrangements, such as, for example,

60 the front segment 17 of the headlamp 9'' and the light housing 18 of the rear light 10'', these being closed off from the outside via appropriate

translucent panes 19 and 20 and being connected on the inside to appropriate parts acting as

65 reflectors 21 and lamp holders 22 respectively. An appropriate roof inner lining 12'' again ensures that

the installation spaces of the lighting devices are covered and again permits access for adjustment and maintenance via appropriate flaps 13''.

According to a further embodiment (not shown), the roof 4 together with the bulged-out portion 5 can be designed as a closed construction part, and the light units 9, 10 and 11 can be

70 attached on the faces 6, 7 and 8 from outside, and the light arrangements 9, 10 and 11 on one side can be joined together into a single constructional unit which has a V-shaped or curved form in a plan view and which moulds itself to the corresponding

75 approximately vertical faces of the crossbeam of the T-shaped bulged-out portion. A roof according to the invention can, of course, also be modified accordingly for a seat

80 arrangement for two or four persons, by arranging the crossbeam of the T-shaped, bulged-out portion according to the headroom zone required

85 in each case. The front wedge-shaped part of the T-shaped bulged-out portion ensures a certain separation of the headlamps on the two vehicle sides, so that

90 dazzling of the oncoming traffic by the high-placed headlamps is reduced.

## CLAIMS

1. A roof for a passenger car, comprising a bulged-out reinforcement portion bounded by steep faces on which are located headlamps,

95 sidelight and indicator light units. 2. A roof as claimed in Claim 1, wherein the bulged-out portion, is generally T-shaped in plan view, the upright of the 'T' being arranged at the front end of the roof and the cross piece of the 'T' being arranged transversely of the car, the bulge

100 being generally trapezoidal in cross-section. 3. A roof for a passenger car, according to Claim 2 in which the headlamp and light arrangements are arranged in recesses in the steep faces, are covered in the vehicle interior by a

105 roof interior lining and are accessible for adjustment and maintenance via orifices and flaps provided in said lining. 4. A roof according to Claim 3 in which, the

110 roof is formed as a constructional part made of plastics material formed integrally with the headlamp and light arrangements. 5. A roof according to Claim 2, in which the headlamp and light arrangements are attached

115 onto the steep faces from outside and, are joined together into a single constructional unit which has, in a plan view, a V-shaped or curved form. 6. A roof according to Claim 3 in which the orifices provided in the roof interior lining for

120 adjustment and maintenance are closed by flaps designed as translucent panes, shuttering means being additionally provided. 7. A roof according to Claim 6, in which the flaps provided in the roof interior lining are

125 opaque, and interior lighting is obtained via an adjustable blind arrangement. 8. A motor vehicle having roof mounted headlamp and light units mounted about a bulge in the roof which acts as a reinforcement and

serves to provide increased headroom within the vehicle, the outer surfaces of the headlamp and light units being streamlined with the remainder of the body.

5 9. A roof for a passenger car constructed substantially as herein described with reference to and as illustrated in the accompanying drawings.

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